

**FINANCIAL ASSISTANCE  
FUNDING OPPORTUNITY ANNOUNCEMENT**



**U. S. Department of Energy  
National Energy Technology Laboratory**

**Recovery Act:**

**Geologic Sequestration Training And Research**

**Funding Opportunity Number: DE-FOA-0000032**

**Announcement Type: Initial**

**CFDA Number: 81.089 Fossil Energy Research and Development**

|                                   |   |
|-----------------------------------|---|
| <b>Issue Date:</b>                | <b>June 29, 2009</b>                                  |
| <b>Letter of Intent Due Date:</b> | <b>Not Applicable</b>                                 |
| <b>Pre-Application Due Date:</b>  | <b>Not Applicable</b>                                 |
| <b>Application Due Date:</b>      | <b>August 11, 2009 at 8:00:00 PM Eastern<br/>Time</b> |

## **NOTE: REGISTRATION/SUBMISSION REQUIREMENTS**

### **Registration Requirements**

There are several one-time actions you must complete to submit an application in response to this Announcement (e.g., obtain a Dun and Bradstreet Data Universal Numbering System (DUNS) number, register with the Central Contractor Registration (CCR), and register with FedConnect). Applicants who are not registered with CCR and FedConnect, should allow at least 10 days to complete these requirements. It is suggested that the process be started as soon as possible.

**Applicants must obtain a DUNS number. DUNS website: <http://fedgov.dnb.com/webform>.**

**Applicants must register with the CCR. CCR website: <http://www.ccr.gov/>**

**Applicants must register with FedConnect to submit their application. FedConnect website: [www.fedconnect.net](http://www.fedconnect.net)**

### **Questions**

Questions relating to the **system requirements or how an application form works** must be directed to Grants.gov at 1-800-518-4726 or [support@grants.gov](mailto:support@grants.gov).

Questions regarding the **content** of the announcement must be submitted through the FedConnect portal. You must register with FedConnect to respond as an interested party to submit questions and to view responses to questions. It is recommended that you register as soon after release of the FOA as possible to have the benefit of all responses. More information is available at <http://www.compusearch.com/products/fedconnect/fedconnect.asp>. DOE will try to respond to a question within 3 business days, unless a similar question and answer have already been posted on the website.

Questions pertaining to the **submission** of applications through FedConnect should be directed by e-mail to [support@FedConnect.net](mailto:support@FedConnect.net) or by phone to FedConnect Support at 800-899-6665.

Any employee from a FedConnect registered entity can individually register to ask/view questions. If you are the first person from your organization to register, FedConnect will need to create a organization account. Only a person who knows your organization's CCR MPIN can do this. To find out who this is in your organization, go to <http://www.ccr.gov/> and click **Search CCR**. Once you've found your organization, locate the Electronic Business Point of Contact. After the initial FedConnect account is created, employees can register themselves without the MPIN. If you are not sure whether your organization has an account with FedConnect, complete the registration form and you will be notified.

### **Application Preparation and Submission**

**Applicants must download the application package, application forms and instructions, from Grants.gov. Grants.gov website: <http://www.grants.gov/>**  
(Additional instructions are provided in Section IV A of this FOA.)

**Applicants must submit their application through the FedConnect portal. FedConnect website: [www.fedconnect.net](http://www.fedconnect.net)**  
(Additional instructions are provided in Section IV H of this FOA.)

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## **SECTION I – FUNDING OPPORTUNITY DESCRIPTION**

### **American Recovery and Reinvestment Act of 2009 (ARRA 2009)**

Projects under this FOA will be funded, in whole or in part, with funds appropriated by the American Recovery and Reinvestment Act of 2009, Pub. L. 111-5, (Recovery Act or Act). The Recovery Act's purposes are to stimulate the economy and to create and retain jobs. The Act gives preference to activities that can be started and completed expeditiously. Accordingly, special consideration will be given to projects that promote and enhance the objectives of the Act, especially job creation, preservation and economic recovery, in an expeditious manner.

Be advised that special terms and conditions apply to projects funded by the Act relating to:

- Reporting, tracking and segregation of incurred costs;
- Reporting on job creation and preservation;
- Publication of information on the Internet;
- Access to records by Inspectors General and the Government Accountability Office;
- Prohibition on use of funds for gambling establishments, aquariums, zoos, golf courses or swimming pools;
- Ensuring that iron, steel and manufactured goods are produced in the United States;
- Ensuring wage rates are comparable to those prevailing on projects of a similar character;
- Protecting whistleblowers and requiring prompt referral of evidence of a false claim to an appropriate inspector general; and
- Certification and Registration.

These special terms and conditions will be based on provisions included in Titles XV and XVI of the Act. The special terms and conditions can be found at [http://management.energy.gov/policy\\_guidance/1672.htm](http://management.energy.gov/policy_guidance/1672.htm).

The Office of Management and Budget (OMB) has issued Implementing Guidance for the Recovery Act. See M-09-10, Initial Implementing Guidance for the American Recovery and Reinvestment Act of 2009 and M-09-15, Updated Implementing Guidance for the American Recovery and Reinvestment Act of 2009. OMB will be issuing additional guidance concerning the Act in the near future. Applicants should consult the DOE website, [www.energy.gov](http://www.energy.gov), the OMB website <http://www.whitehouse.gov/omb/>, and the Recovery website, [www.recovery.gov](http://www.recovery.gov) regularly to keep abreast of guidance and information as it evolves.

Recipients of funding appropriated by the Act shall comply with requirements of applicable Federal, State, and local laws, regulations, DOE policy and guidance, and instructions in this FOA, unless relief has been granted by DOE. Recipients shall flow down the requirements of applicable Federal, State and local laws, regulations DOE policy and guidance, and instructions in this FOA to subrecipients at any tier to the extent necessary to ensure the recipient's compliance with the requirements.

Be advised that Recovery Act funds can be used in conjunction with other funding as necessary to complete projects, but tracking and reporting must be separate to meet the reporting requirements of the Recovery Act and related OMB Guidance. Applicants for projects funded by sources other than the Recovery Act should plan to keep separate records for Recovery Act funds and to ensure those records comply with the requirements of the Act. Funding provided through the Recovery Act that is supplemental to an existing grant is one-time funding.

Applicants should require their first tier subawardees to obtain a DUNS number (or update the existing DUNS record) and register with the Central Contractor Registration (CCR).

## **Background**

The Department of Energy's (DOE's) Carbon Sequestration Program within the Office of Fossil Energy's (FE's) Coal Program involves two key elements for technology development and research: 1) core R&D and 2) infrastructure. The core R&D element contains five focal areas for carbon sequestration technology development: 1) capture, 2) geologic carbon storage, 3) monitoring, verification, and accounting (MVA), 4) carbon dioxide (CO<sub>2</sub>) use, and 5) simulation and risk assessment. Core R&D is driven by technology needs and is accomplished through laboratory and pilot-scale research aimed at developing new technologies and new systems for CO<sub>2</sub>-emission mitigation. The Infrastructure element includes large-scale projects and the Regional Carbon Sequestration Partnerships (RCSPs). An awareness of current and completed research and development activities in the carbon sequestration area will be important to achieving the proper balance of integration with other funded activities. For additional information on DOE's carbon sequestration activities, please visit: [http://www.netl.doe.gov/technologies/carbon\\_seq/index.html](http://www.netl.doe.gov/technologies/carbon_seq/index.html).

Carbon capture and storage (CCS) technologies offer great potential for reducing CO<sub>2</sub> emissions and mitigating global climate change. Deploying these technologies will require a significantly expanded workforce trained in the various specialties that are currently under-represented in the United States. Education and training activities undertaken in this project will develop a future generation of geologists, scientists, and engineers that will provide the human capital and skills required for implementing and deploying CCS technologies.

## **Objectives**

Grant applications from universities, colleges, and college-affiliated research institutions and Historically Black Colleges and Universities and Other Minority Institutions (HBCU/OMI) are sought to provide training opportunities for graduate and undergraduate students that will provide the human capital and skills required for implementing and deploying CCS technologies. Training can be accomplished through fundamental research in the CCS technology area. Fundamental research is needed to advance science in: simulation and risk assessment; monitoring, verification, and accounting; geological related analytical tools; methods to interpret geophysical models; well completion and integrity for long-term CO<sub>2</sub> storage; and CO<sub>2</sub> capture.

The Geological Sequestration Training and Research Program will advance the United States in its position as the leader in technology for addressing climate change and for developing near-zero emission technologies to significantly reduce CO<sub>2</sub> emissions from power plants. The results of these projects will make a vital contribution to the scientific, technical, and institutional knowledge necessary to establish frameworks for the development of commercial CCS projects. These projects will produce a trained workforce necessary for the CCS industry with skills and competencies in geology, geophysics, geomechanics, geochemistry and reservoir engineering disciplines. Teaching professors wishing to transition into CCS-related fields of study are encouraged. Industry scientists and engineers wishing to consider teaching professorships in CCS-related fields of study are encouraged.

DOE envisions awarding multiple financial assistance awards in the form of grants. The number of applications selected for negotiations leading to award is anticipated to be approximately 42 (26 awards for all universities, colleges, and college-affiliated research institutions and 16 awards for HBCU/OMI), but may depend on quality of applications submitted and the availability of funds. The estimated period of performance for each award will be three years with one budget period lasting the duration of the award.

DOE recognizes the National Science Foundation's (NSF) efforts to support basic research in the field of CCS science and engineering. The work supported through this FOA will leverage these efforts to

increase our understanding of CCS and continue to move the research towards more applied technologies.

### **Areas of Interest**

Carbon capture and storage (CCS) is being evaluated as a viable means for reducing greenhouse gas emissions and mitigating global climate change. Grant applications from universities, colleges, and college-affiliated research institutions are sought to provide training opportunities for graduate and undergraduate students that will provide the human capital and skills required for implementing and deploying CCS technologies. Training can be accomplished through fundamental research in the CCS technology area. Fundamental research is needed to advance science in one or more of the following areas. The applicant is required to apply under one of the following five areas of interest:

1. Simulation and Risk Assessment - The ability to predict the behavior of CO<sub>2</sub> in the subsurface and anticipate risks to a sequestration project is critical to the planning, operating, and closing of an effective sequestration project. Some of the key areas that need additional research are: development of models that include full coupling of geochemical processes (subsurface chemical reactions among CO<sub>2</sub>, groundwater/brine, and rock), geomechanical processes (how faults and fractures affect fluid pressure and CO<sub>2</sub> migration, and the converse of fluid pressure inducing rock deformation), and heat processes (temperature changes induced by CO<sub>2</sub> injection, associated CO<sub>2</sub> phase changes and chemical reactions) with fluid flow; improved ability to forecast CO<sub>2</sub> behavior and ultimate fate in the subsurface; development and application of process-based risk assessment models for determining quantitative risks and predicting quantitative impacts at field project sites; and development of probability distributions for different risk pathways.
2. Monitoring, Verification, and Accounting (MVA) - MVA will require significant research and resources to develop better technologies and protocols to verify and account for the volume of CO<sub>2</sub> injected into deep geologic formations. The areas of research that are needed include: improving quantification, sensitivity, and resolution at low costs in all areas of MVA; extending the capacity of the MVA tool to quantify and resolve at high sensitivity over an extended region or spatial scale; increasing the accountability of MVA protocols by improving the sensitivity and increasing the application of current monitoring tools; improving the reliability of next-generation detection and sensing technologies; modifying and advancing CO<sub>2</sub> accounting protocols to demonstrate containment of CO<sub>2</sub> in the storage formations; quantifying the mass of sequestered CO<sub>2</sub>, not only over its volume (both depth and lateral extent) but also as a function of time; investigating and improving technologies and protocols aimed at assessing the integrity of caprock formations; and pinpointing potential leakage pathways. Technology development in the areas of geophysics (large spatial analyses of subsurface plumes; quantification of CO<sub>2</sub> distribution in the subsurface; etc.), geochemistry (source identification of the CO<sub>2</sub> plume and determination of reaction with the reservoir), in situ analyses in the subsurface (rapid determination of CO<sub>2</sub> plume and also determination of migration, leakage of the CO<sub>2</sub> plume out of the target reservoir), and mitigation strategies (seal mechanisms that can be induced if leakage occurs or proactive mitigation through remediation/plugging of abandoned wellbores) are needed.
3. Well completion, stimulation, and integrity - Improvements in well construction practices and reservoir stimulation for CO<sub>2</sub> storage are needed to improve well completion, CO<sub>2</sub> injectivity and well integrity for long term CO<sub>2</sub> storage. Research is needed for reservoir stimulation for injection of CO<sub>2</sub>, microhole drilling technologies utilized for low cost characterization opportunities and to drill relatively shallow injection and/or monitoring wells; casing and cements that perform effectively under CO<sub>2</sub> injection and storage; and underbalanced drilling that may not damage the target formation.

4. Capture and Transport – Capture and transport of CO<sub>2</sub> is the first step in geologic sequestration. Capture can be divided into three main-categories: pre-combustion, post-combustion, and oxy-combustion capture. Transport of CO<sub>2</sub> is done commercially with relatively pure gas streams but the opportunity exists to store CO<sub>2</sub> containing impurities (such as H<sub>2</sub>S, SO<sub>x</sub>, NO<sub>x</sub>, and O<sub>2</sub>, all in low concentration) to reduce the cost of CO<sub>2</sub> capture.
- Pipeline Transport - Research is needed in areas of pipeline transport that permit the safe and economical transport of CO<sub>2</sub> containing impurities (such as H<sub>2</sub>S, SO<sub>x</sub>, NO<sub>x</sub>, and O<sub>2</sub>, all in low concentrations) in a secure and environmentally sound manner.
  - Pre-Combustion Capture – Pre-combustion CO<sub>2</sub> capture involves science and technologies that address specific technical challenges and barriers for de-carbonizing turbine fuel feeds. Research is needed in the following areas to advance pre-combustion capture: high-temperature, high-pressure membranes; high-efficiency solvents; solid sorbents with commercially-relevant separation capacity and regenerability; and advanced separation devices for separating CO<sub>2</sub> or H<sub>2</sub> from shifted syngas.

Post-Combustion Capture – Research is needed on post-combustion capture systems that use membranes, solvents, solid sorbents, or other approaches that enable the efficient capture of CO<sub>2</sub> from flue gas. Improved post-combustion systems that capture CO<sub>2</sub> from coal-fired power plant flue gas are needed for large flue gas volumes, relatively low CO<sub>2</sub> concentration (less than 15 % by volume), and low flue gas pressure (i.e., driving force). In addition, post-combustion systems are needed that are tolerant to flue gas contaminants (e.g., SO<sub>2</sub>, trace elements, uncollected flyash). Research is also needed on CO<sub>2</sub> air capture (direct capture of CO<sub>2</sub> from the atmosphere) that can advance air capture from its immature state to a scale significant enough to play a role as a mitigation option. Research is needed such that the air capture system proposed is not a net CO<sub>2</sub> generator. If renewable energy sources are used in the process for heat or power, then the effect of not directly using those energy sources to produce power to produce potentially better environmental or economical benefits must be assessed.

- Oxy-Combustion Capture - While the key technical components of oxy-combustion systems are commercially available, an integrated commercially operated oxy-combustion power plant has yet to be demonstrated. To support the development of this technology several technical hurdles exist. Research is required to optimize oxy-combustion burners so that flue gas recirculation is minimized and boiler efficiency is maximized. Also, research is required to fully assess the amount of air infiltration expected on retrofit applications, while developing methodologies for the reduction of air infiltration. New methods to produce oxygen, having significantly lower energy costs, are also sought.

There is a significant need in the DOE's carbon sequestration activity within the Coal Program to fund training and research in geological sequestration. The availability of trained people has been a limiting factor during research into this technology and will be a major barrier to its deployment on wide-scale. This new focus will be the beginning of a continuing effort for resource training and will be a key to continuing training while utilizing ongoing R&D field projects for hands-on training opportunities. The results of this activity will be the development of a trained workforce for the CCS industry with the skills required for implementing and deploying CCS technologies.

## **SECTION II – AWARD INFORMATION**

### **A. TYPE OF AWARD INSTRUMENT**

DOE anticipates awarding grants under this program announcement.

### **B. ESTIMATED FUNDING**

Approximately \$12,930,000 is expected to be available for new awards under this announcement for the following two categories: (1) all universities, colleges, and college-affiliated research institutions (approximately \$7,930,000); and (2) HBCU/OMI (approximately \$5,000,000). However, funding is contingent upon the number and quality of applications submitted and the availability of funds.

### **C. MAXIMUM AND MINIMUM AWARD SIZE**

- Ceiling (i.e., the maximum amount for an individual award made under this announcement):  
\$ 300,000 DOE Funding
- Floor (i.e., the minimum amount for an individual award made under this announcement):  
\$ 100,000 DOE Funding

### **D. EXPECTED NUMBER OF AWARDS**

Under this announcement, DOE expects to make the following number of awards for each type of recipient:

*\*Note: Eligibility is restricted to the categories listed below.*

| <b>University Research Grants</b>  | <b>Estimated Number of Awards</b> |
|--|-----------------------------------|
| All universities, colleges, and college-affiliated research institutions | 26                                |
| HBCU / OMI   | 16                                |
| <b><i>Total</i></b>  | <b><i>42</i></b>                  |

### **E. ANTICIPATED AWARD SIZE**

DOE anticipates awards will be in the \$300,000 range for the total project period.

### **F. PERIOD OF PERFORMANCE**

DOE anticipates making awards with a performance period for up to 3 years.

### **G. TYPE OF APPLICATION**

DOE will accept only new applications under this announcement.



### **SECTION III - ELIGIBILITY INFORMATION**

#### **A. ELIGIBLE APPLICANTS**

In accordance with 10 CFR 600.6(b), eligibility for award is restricted to the following:

1. **All universities, colleges, and college-affiliated research institutions** - A university is an institution of higher education and research, which grants academic degrees in a variety of subjects. University personnel have the experience and technical knowledge to accomplish the goals of these projects. The university setting provides an environment conducive to encourage and support the development of a future generation of geologists, scientists and engineers to fill the gap and provide the skills required for national-scale large volume geologic storage projects.

*For the first category (all universities, colleges, and college-affiliated research institutions), the following eligibility criteria apply:*

- Principal Investigator or Co-Principal Investigator listed on the application must be a teaching professor at the proposing university. If this condition is met, other participants, i.e., Co-Principal Investigators or research staff, who do not hold teaching or student positions may be included as part of the research team.
- Applications from university or college-affiliated research institutions must be submitted through the college or university with whom they are affiliated.
- At least two students registered at the university or college is to receive compensation for work performed in the conduct of the research proposed.

2. **HBCU/OMI** – Eligibility for awards under applicant category 2 is restricted to Historically Black Colleges and Universities or Other Minority Institutions (HBCUs/OMIs) as educational entities recognized by the Office of Civil Rights (OCR), U.S. Department of Education, and identified on the OCR's Department of Education U.S. accredited postsecondary minorities institution list at (<http://www.ed.gov/about/offices/list/ocr/edlite-minorityinst.html>) in effect on the closing date of the program Announcement.

*For the second category (HBCU/OMI), the following eligibility criteria apply:*

- Applicants must be an HBCU/OMI as defined above.
- Principal Investigator or Co-Principal Investigator listed on the application must be a teaching professor at the proposing university. If this condition is met, other participants, i.e., Co-Principal Investigators or research staff, who do not hold teaching or student positions may be included as part of the research team.
- Applications from university or college-affiliated research institutions must be submitted through the college or university with whom they are affiliated.
- At least two students registered at the university or college is to receive compensation for work performed in the conduct of the research proposed.

Only universities, colleges, or college-affiliated research institutes located in the United States of America and its territories, including the Commonwealth of Puerto Rico and the Virgin Islands, may submit applications for consideration under this FOA. Submissions from college-affiliated research institutes must be made through the university. The university, not the college-affiliated research institute, will be the award recipient.

## B. COST SHARING

Cost sharing is encouraged but not required.

## C. OTHER ELIGIBILITY REQUIREMENTS

### 1. Federally Funded Research and Development Center (FFRDC) Contractors

FFRDC contractors are not eligible for an award under this announcement, but they may be proposed as a team member on another entity's application subject to the following guidelines:

Authorization for non-DOE FFRDCs. The Federal agency sponsoring the FFRDC contractor must authorize in writing the use of the FFRDC contractor on the proposed project and this authorization must be submitted with the application. The use of a FFRDC contractor must be consistent with the contractor's authority under its award and must not place the FFRDC contractor in direct competition with the private sector.

Authorization for DOE FFRDCs. The cognizant contracting officer for the FFRDC must authorize in writing the use of a DOE FFRDC contractor on the proposed project and this authorization must be submitted with the application. The following wording is acceptable for this authorization.

"Authorization is granted for the \_\_\_\_\_ Laboratory to participate in the proposed project. The work proposed for the laboratory is consistent with or complimentary to the missions of the laboratory, will not adversely impact execution of the DOE assigned programs at the laboratory, and will not place the laboratory in direct competition with the domestic private sector."

Value/Funding. The value of, and funding for, the FFRDC contractor portion of the work will not normally be included in the award to a successful applicant but will be included in the cost estimate of the submitted proposal. Usually, DOE will fund a DOE FFRDC contractor through the DOE field work proposal system and other FFRDC contractors through an interagency agreement with the sponsoring agency.

Cost Share. Any cost share proposed by the applicant will be based on the total cost of the project, including the applicant's and the FFRDC contractor's portions of the effort.

FFRDC Contractor Effort. The FFRDC contractor effort, in aggregate, **shall not exceed 25%** of the total estimated cost of the project, including the applicant's and the FFRDC contractor's portions of the effort.

Responsibility. The applicant, if successful, will be the responsible authority regarding the settlement and satisfaction of all contractual and administrative issues, including but not limited to, disputes and claims arising out of any agreement between the applicant and the FFRDC contractor.

### 2. Subcontractor Effort

#### A. University Subcontractor Effort

University subcontractor effort is allowable under this FOA, provided that the subcontractor meets the following criteria:

- I. Principal Investigator at the subcontractor level must be a teaching professor at the proposing subcontractor university, college, college-affiliated research institution and/or subcontractor HBCU/OMI. If this condition is met, other participants, i.e., Co-Principal Investigators or research staff, who do not hold teaching or student positions may be included as part of the research team.
- II. At least one student registered at the subcontractor university, college, college-affiliated research institution and/or subcontractor HBCU/OMI is to receive compensation for work performed in the conduct of the research proposed.
- III. The subcontractor effort, in aggregate, **shall not exceed 25%** of the total estimated cost of the project, including the applicant's and the subcontractor's portions of the effort.

## **B. Industrial collaboration**

Industrial collaboration is permissible under the following conditions:

- I. Cash cost sharing received by the university awardee from each industry participant.
- II. No-cost collaboration with the industrial participant(s) agreeing to consult with the Principal Investigator and to share non-proprietary information that will assist in improving the experimental plan and/or assist in analyzing data obtained by the Principal Investigator. Free use of industrial experimental facilities not available at the University is included in this category of collaboration.
- III. DOE funding may not be used to fund industrial collaboration.

## **SECTION IV – APPLICATION AND SUBMISSION INFORMATION**

### **A. ADDRESS TO REQUEST APPLICATION PACKAGE**

Application forms and instructions are available at Grants.gov. To access these materials, go to <http://www.grants.gov>, select “Apply for Grants,” and then select “Download Application Package.” Enter the CFDA and/or the funding opportunity number located on the cover of this announcement and then follow the prompts to save the application package. Once you have SAVED the application package and completed all the required documentation, you will submit your application via the FedConnect portal. **DO NOT use the Save & Submit selection in Grants.gov.**

### **B. LETTER OF INTENT AND PRE-APPLICATION**

#### **1. Letter of Intent**

Letters of Intent are not required.

#### **2. Pre-application**

Pre-applications are not required.

### **C. CONTENT AND FORM OF APPLICATION – 424 (R&R)**

You must complete the mandatory forms and any applicable optional forms (e.g., Disclosure of Lobbying Activities (SF-LLL)) in accordance with the instructions on the forms and the additional instructions below. Files that are attached to the forms must be in Adobe Portable Document Format (PDF) unless otherwise specified in this announcement.

#### **1. SF 424 (R&R)**

Complete this form first to populate data in other forms. Complete all the required fields in accordance with the pop-up instructions on the form. The list of certifications and assurances referenced in Field 17 can be found on the DOE Financial Assistance Forms Page at [http://management.energy.gov/business\\_doe/business\\_forms.htm](http://management.energy.gov/business_doe/business_forms.htm) under Certification and Assurances.

#### **2. RESEARCH AND RELATED Other Project Information**

Complete questions 1 through 6 and attach files. The files must comply with the following instructions:

##### ***Project Summary/Abstract (Field 7 on the Form)***

The project summary/abstract must contain a summary of the proposed activity suitable for dissemination to the public. It should be a self-contained document that identifies the name of the applicant, the project director/principal investigator(s), area of interest under which the application is being submitted (see Section I – Areas of Interest for description of each area), the project title, the objectives of the project, a description of the project, including methods to be employed, the potential impact of the project (i.e., benefits, outcomes), and major participants (for collaborative projects). This document must not include any proprietary or sensitive business information as the Department may make it available to the public. The project summary must not exceed **1 page, double-spaced**, when printed using standard 8.5” by 11” paper with 1” margins (top, bottom, left and right) with font not smaller than 11 point. To attach a Project

Summary/Abstract, click “Add Attachment.”

***Project Narrative (Field 8 on the Form)***

The project narrative must not exceed **15 pages, DOUBLE-SPACED**, including cover page, table of contents, charts, graphs, maps, photographs, and other pictorial presentations, when printed using standard 8.5” by 11” paper with 1 inch margins (top, bottom, left, and right).

**EVALUATORS WILL ONLY REVIEW THE NUMBER OF PAGES SPECIFIED IN THE PRECEDING SENTENCE.** The font must not be smaller than 11 point. Do not include any Internet addresses (URLs) that provide information necessary to review the application, because the information contained in these sites will not be reviewed. See Section VIII.D for instructions on how to mark proprietary application information. To attach a Project Narrative, click “Add Attachment.”

The project narrative must include the following sections that **WILL** count towards the page limitation:

- **Project Objectives**: This section should provide a clear, concise statement of the specific objectives/aims of the proposed project.
- **Merit Review Criterion Discussion**: The section should be formatted to address each of the merit review criterion and sub-criterion listed in Section V.A. Provide sufficient information so that reviewers will be able to evaluate the application in accordance with these merit review criteria. **DOE WILL EVALUATE AND CONSIDER ONLY THOSE APPLICATIONS THAT ADDRESS SEPARATELY EACH OF THE MERIT REVIEW CRITERION AND SUB-CRITERION.**
- **Relevance and Outcomes/Impacts**: This section should explain the relevance of the effort to the objectives in the program announcement and the expected outcomes and/or impacts.
- **Roles Of Participants**: For multi-organizational or multi-investigator projects, describe the roles and the work to be performed by each participant/investigator, business agreements between the applicant and participants, and how the various efforts will be integrated and managed.
- **Multiple Principal Investigators**: The applicant, whether a single organization or team/partnership/consortium, must indicate if the project will include multiple PIs. This decision is solely the responsibility of the applicant.

If multiple PIs will be designated, the application must identify the Contact PI/Project Coordinator and provide a “Coordination and Management Plan” that describes the organization structure of the project as it pertains to the designation of multiple PIs. This plan should, at a minimum, include:

- process for making decisions on scientific/technical direction;
- publications;
- intellectual property issues;
- communication plans;
- procedures for resolving conflicts; and
- PIs’ roles and administrative, technical, and scientific responsibilities for the project.

- Statement Of Project Objectives (SOPO): The Department of Energy's National Energy Technology Laboratory uses a specific format for Statement of Project Objectives in its awards. In announcements such as this one, where the Government does not provide a Statement of Project Objectives, the Applicant is to provide one, which the DOE will then use to generate the Statement of Project Objectives to be included in the award.

The project narrative must contain a single, detailed Statement of Project Objectives that addresses how the project objectives will be met. The Statement of Project Objectives must contain a clear, concise description of all activities to be completed during project performance and follow the structure discussed below. The Statement of Project Objectives may be released to the public by DOE in whole or in part at any time. It is therefore required that it shall not contain proprietary or confidential business information.

The Statement of Project Objectives is generally less than **5 pages** in total, **double-spaced** for the proposed work and **WILL** count toward the Project Narrative page limitation. Applicants shall prepare the Statement of Project Objectives in the following format:

#### TITLE OF WORK TO BE PERFORMED

(Insert the title of work to be performed. Be concise and descriptive.)

#### A. OBJECTIVES

Include one paragraph on the overall objective(s) of the work. Also, include objective(s) for each phase of the work.

#### B. SCOPE OF WORK

This section should not exceed one-half page and should summarize the effort and approach to achieve the objective(s) of the work for each Phase.

#### C. TASKS TO BE PERFORMED

Tasks, concisely written, should be provided in a logical sequence and should be divided into the phases of the project, as appropriate. This section provides a brief summary of the planned approach to this project. An outline of the Project Management Plan (referenced in Task 1.0 below and required to be submitted with your application) is provided later in this Section.

#### PHASE I

##### Task 1.0 – Project Management and Planning

(Description includes work elements required to revise and maintain the Project Management Plan and to manage and report on activities in accordance with the plan)

##### Subtask 1.1

(Description)

##### Task 2.0 - (Title)

## PHASE II (Optional)

### Task 3.0 - (Title)

#### D. DELIVERABLES

The periodic, topical, and final reports shall be submitted in accordance with the attached "Federal Assistance Reporting Checklist" and the instructions accompanying the checklist. (See Section VI C for sample of reporting requirements for this program).

[Note: The Recipient shall provide a list of deliverables other than those identified on the "Federal Assistance Reporting Checklist" that will be delivered. These reports shall also be identified within the text of the Statement of Project Objectives. See the following examples:

1. Task 1.1 - (Report Description)
2. Task 2.2 - (Report Description)

#### E. BRIEFINGS/TECHNICAL PRESENTATIONS (If applicable)

The Recipient shall prepare detailed briefings for presentation to the Project Officer at the Project Officer's facility located in Pittsburgh, PA or Morgantown, WV. Briefings shall be given by the Recipient to explain the plans, progress, and results of the technical effort. The Recipient shall make presentations to the NETL Project Officer/Manager at a project kick-off meeting (to be held by March 2010), annual briefings (to be held by April 2011 and April 2012), PI Progress review and initiation of Year 2 (December 2010), and a final project briefing.

The Recipient shall provide and present a technical paper(s) at the DOE/NETL Annual Contractor's Review Meeting to be held at the NETL facility located in Pittsburgh, PA or Morgantown, WV, and at least one other technical conference each year, as approved by the NETL Project Officer/Manager.

(End of SOPO)

- Identification of Potential Conflicts of Interest or Bias in Selection of Reviewers

#### Appendix:

This appendix **WILL NOT** count in the Project Narrative page limitation. Provide the following information in this section.

Collaborators and Co-editors: List in alphabetical order all persons, including their current organizational affiliation, who are, or who have been, collaborators or co-authors with you on a research project, book or book article, report, abstract, or paper during the 48 months preceding the submission of this application. Also, list any individuals who are currently, or have been, co-editors with you on a special issue of a journal, compendium, or conference proceedings during the 24 months preceding the submission of this application. If there are no collaborators or co-editors to report, state "None."

Graduate and Postdoctoral Advisors and Advisees: List the names and current organizational affiliations of your graduate advisor(s) and principal postdoctoral

sponsor(s) during the last 5 years. Also, list the names and current organizational affiliations of your graduate students and postdoctoral associates.

- Bibliography & References Cited Appendix:  
This appendix **WILL NOT** count in the Project Narrative page limitation. Provide a bibliography of any references cited in the Project Narrative. Each reference must include the names of all authors (in the same sequence in which they appear in the publication), the article and journal title, book title, volume number, page numbers, and year of publication. Include only bibliographic citations. Applicants should be especially careful to follow scholarly practices in providing citations for source materials relied upon when preparing any section of the application. In order to reduce the number of files attached to your application, please provide the Bibliography and References Cited information as an appendix to your project narrative. Do not attach a file in Field 9.
- Facilities & Other Resources Appendix:  
This appendix **WILL NOT** count in the Project Narrative page limitation. This information is used to assess the capability of the organizational resources, including subawardee resources, available to perform the effort proposed. Identify the facilities to be used (Laboratory, Animal, Computer, Office, Clinical, and Other). If appropriate, indicate their capacities, pertinent capabilities, relative proximity, and extent of availability to the project. Describe only those resources that are directly applicable to the proposed work. Describe other resources available to the project (e.g., machine shop, electronic shop) and the extent to which they would be available to the project. In order to reduce the number of files attached to your application, please provide the Facility and Other Resource information as an appendix to your project narrative. Do not attach a file in Field 10.
- Equipment Appendix:  
This appendix **WILL NOT** count in the Project Narrative page limitation. List major items of equipment already available for this project and, if appropriate identify location and pertinent capabilities. In order to reduce the number of files attached to your application, please provide the Equipment information as an appendix to your project narrative. Do not attach a file in Field 11.

(End of Project Narrative)

***Other Attachments (Field 12 on the form):***

If you need to elaborate on your responses to questions 1-6 on the "Other Project Information" document, attach a file in Field 12.

Also, attach the following files:

**Project Management Plan.**

This plan should be formatted to include the following sections with each section to include the information as described below:

A. Executive Summary: Provide a description of the project that includes the objective, project goals, and expected results. For purposes of the application, this information is included in the Project Narrative (Field 8) and should be simply copied to this document for



completeness, so that the Project Management Plan is a stand-alone document.

B. Risk Management: Provide a summary description of the proposed approach to identify, analyze, and respond to perceived risks associated with the proposed project. Project risk events are uncertain future events that, if realized, impact the success of the project. As a minimum, include the initial identification of significant technical, resource, and management issues that have the potential to impede project progress and strategies to minimize impacts from those issues.

C. Milestone Log: Provide milestones for each budget period (or phase) of the project. Each milestone should include a title and planned completion date. Milestones should be quantitative and show progress toward budget period and/or project goals.

[Note: During project performance, the Recipient will report the Milestone Status as part of the required quarterly Progress Report. See sample reporting requirements under Section VI C. The Milestone Status will present actual performance in comparison with Milestone Log, and include:

- (1) the **actual** status and progress of the project,
- (2) specific progress made toward achieving the project's milestones, and,
- (3) any proposed changes in the project's schedule required to complete milestones. ]

D. Funding and Costing Profile: Provide a table (the Project Funding Profile) that shows, by budget period, the amount of government funding going to each project team member. Also provide a table (the Project Costing Profile) that projects, by month, the expenditure of government funds for the first budget period, at a minimum.

E. Resource Loaded Schedule: Provide a resource loaded schedule linking scope, schedule, and budgeted cost of specific Work Breakdown Structure elements. This shall include a timeline of the project (created in Microsoft Project or equivalent software) broken down by each task and subtask, as described in the Statement of Project Objectives. The timeline should include for each task, a start date, and end date. The timeline should show interdependencies between tasks and include the milestones that are identified in the Milestone Log (Section C). This will be used to guarantee that sufficient resources will be allocated to ensure completion of all activities.

F. Success Criteria at Decision Points: Provide success criteria for each decision point in the project, including go/no-go decision points and the conclusions of budget periods and the entire project. The success criteria should be objective and stated in terms of specific, measurable, and repeatable data. Usually, the success criteria pertain to desirable outcomes, results, and observations from the project.

[Note: As the first task in the Statement of Project Objectives, successful applicants will revise the version of the Project Management Plan that is submitted with their applications by including details from the negotiation process. This Project Management Plan will be updated by the Recipient as the project progresses, and the Recipient must use this plan to report schedule and budget variances.]

Save this plan in a single file named "pmp.pdf" and click on "Add Attachments" in Field 12 to attach.

### **Commitment Letters from Third Parties Contributing to Cost Sharing, if applicable**

If a third party, (i.e., a party other than the organization submitting the application) proposes to provide all or part of the cost sharing (if offered), the applicant must include a letter from the third party stating that it is committed to providing a specific minimum dollar amount of cost sharing. The letter should also identify the proposed cost sharing (e.g., cash, services, and/or property) to be contributed. Letters must be signed by the person authorized to commit the expenditure of funds by the entity and be provided in a PDF format. Save this information in a single file named "CLTP.pdf" and click on "Add Attachments" in Field 12 to attach.

#### **Teaching Professor/Student Employment Certification.**

1. For the first category of eligible applicants (**all universities, colleges, and college-affiliated research institutions**), the following teaching professor/student employment certification is required:

The Principal Investigator or Co-Principal Investigator listed on the application must be a teaching professor at the submitting college/university. Additionally, applications submitted have an additional requirement that at least two registered students at the college/university must receive compensation for work performed in conducting the proposed research.

The Teaching Professor/Student Employment Certification (see format below) must be signed by the Principal Investigator or a Co-Principal Investigator of the submitting university/college and be provided in PDF format. Save this information in a single file named "TeachCert.pdf" and click on "Add Attachments" in Field 12 to attach.

This certification must also be provided by any other college/university participating in the proposed effort.

TEACHING PROFESSOR/STUDENT EMPLOYMENT CERTIFICATION-FUNDING OPPORTUNITY NO. DE-FOA-0000032.

I, \_\_\_\_\_, certify that I am a teaching professor at \_\_\_\_\_ . Furthermore, if a grant is awarded from this application, at least two students registered at the college / university will receive compensation throughout the performance period of research proposed in the application.

\_\_\_\_\_  
(Name of Principal Investigator or  
Co-Principal Investigator and title)

\_\_\_\_\_  
(Date)

**--- OR ---**

2. For the second category of eligible applicants (**HBCU/OMI**), the following teaching professor/student employment certification is required:

The Principal Investigator and/or Co-Principal Investigator(s) (if applicable) must be teaching professor(s) at an HBCU/OMI. Additionally, a minimum of 30 % of

personnel time invoiced under the grant must be used to support a student for each year of the grant. Additionally, applications submitted have an additional requirement that at least two registered students at the HBCU/OMI must receive compensation for work performed in conducting the proposed research.

The Teaching Professor/Student Employment Certification (see format below) must be signed by the Principal Investigator or a Co-Principal Investigator of the submitting HBCU/OMI and be provided in PDF format. Save this information in a single file named "TeachCert.pdf" and click on "Add Attachments" in Field 12 to attach.

This certification must also be provided by any other HBCU/OMI participating in the proposed effort.

TEACHING PROFESSOR/STUDENT EMPLOYMENT CERTIFICATION-FUNDING OPPORTUNITY NO. DE-FOA-0000032.

I, \_\_\_\_\_, certify that I am a teaching professor at \_\_\_\_\_. Furthermore, if a grant is awarded from this application, at least two students registered at the HBCU/OMI will receive compensation throughout the performance period of research proposed in the application.

\_\_\_\_\_  
(Name of Principal Investigator or  
Co-Principal Investigator and title)

\_\_\_\_\_  
(Date)

**Budget for DOE Federally Funded Research and Development Center (FFRDC)**

**Contractor, if applicable.** If a DOE FFRDC contractor is to perform a portion of the work, you must provide a DOE Field Work Proposal in accordance with the requirements in DOE Order 412.1 Work Authorization System. This order and the DOE Field Work Proposal form are available at [http://management.energy.gov/business\\_doe/business\\_forms.htm](http://management.energy.gov/business_doe/business_forms.htm). Use the FFRDC name as the file name (up to 10 letters) and attach to the R&R Other Project Information form in Field 12 – Add Attachments.

**3. RESEARCH AND RELATED Senior/Key Person**

Complete this form before the Budget form to populate data on the Budget form. Beginning with the PD/PI, provide a profile for each senior/key person proposed. A senior/key person is any individual who contributes in a substantive, measurable way to the scientific/technical development or execution of the project, whether or not a salary is proposed for this individual. Subawardees and consultants must be included if they meet this definition. Use the Next Person button to expand the form to add additional senior/key persons.

For each senior/key person provide:

***Biographical Sketch.***

Complete a biographical sketch for each senior/key person and attach to the "Attach Biographical Sketch" field in each profile. The biographical information for each person must not exceed 2 pages when printed on 8.5" by 11" paper with 1 inch margins (top, bottom, left, and right) with font not smaller than 11 point and must include:

**Education and Training.** Undergraduate, graduate and postdoctoral training, provide institution, major/area, degree and year.

**Research and Professional Experience:** Beginning with the current position list, in chronological order, professional/academic positions with a brief description.

**Publications.** Provide a list of up to 10 publications most closely related to the proposed project. For each publication, identify the names of all authors (in the same sequence in which they appear in the publication), the article title, book or journal title, volume number, page numbers, year of publication, and website address if available electronically.

Patents, copyrights, and software systems developed may be provided in addition to or substituted for publications.

**Synergistic Activities.** List no more than 5 professional and scholarly activities related to the effort proposed.

***Current and Pending Support***

Current and pending support information is not required for this program. Do not attach a Current and Pending Support file.

**4. RESEARCH AND RELATED BUDGET (TOTAL FED + NON-FED)**

Complete the Research and Related Budget (Total Fed & Non-Fed) form in accordance with the instructions on the form and the following instructions. You must complete a separate budget for each year of support requested. The form will generate a cumulative budget for the total project period. You must complete all the mandatory information on the form before the NEXT PERIOD button is activated. You may request funds under any of the categories listed as long as the item and amount are necessary to perform the proposed work, meet all the criteria for allowability under the applicable Federal cost principles, and are not prohibited by the funding restrictions in this announcement (See Section IV. G).

**Budget Justification (Field K on the form).**

Provide the required supporting information for the following costs (See R&R instructions): equipment; domestic travel; participant/trainees; material and supplies; publication; consultant services; ADP/computer services; subaward/consortium/contractual; equipment or facility rental/user fees; alterations and renovations; and indirect cost type. Provide any other information you wish to submit to justify your budget request. If cost sharing is proposed, provide an explanation of the source, nature, amount, and availability of any proposed cost sharing. Attach a single budget justification file for the entire project period in Field K. The file automatically carries over to each budget year.

**ARRA 2009 Additional Budget Justification Information**

Applications shall provide information which validates that all laborers and mechanics on projects funded directly by or assisted in whole or in part by and through funding appropriated by the Act are paid wages at rates not less than those prevailing on projects of a character similar in the locality as determined by subchapter IV of Chapter 31 of title 40, United States Code (Davis-Bacon Act). For guidance on how to comply with this provision, see <http://www.dol.gov/esa/whd/contracts/dbra.htm>.

**5. R&R SUBAWARD (Total Fed + Non-Fed) FORM**

Budgets for Subawardees, other than DOE FFRDC Contractors. You must provide a separate cumulative R&R budget for each subawardee that is expected to perform work estimated to be more than \$100,000 or 50 percent of the total work effort (whichever is less). Download the R&R Budget Attachment from the R&R SUBAWARD BUDGET (Total Fed + Non-Fed) FORM and e-mail it to each subawardee that is required to submit a separate budget. After the Subawardee has e-mailed its completed budget back to you, attach it to one of the blocks provided on the form. Use up to 10 letters of the subawardee's name as the file name.

**6. PROJECT/PERFORMANCE SITE LOCATION(S)**

Indicate the primary site where the work will be performed. If a portion of the project will be performed at any other site(s), identify the site location(s) in the blocks provided.

**Note that the Project/Performance Site Congressional District is entered in the format of the 2 digit state code followed by a dash and a 3 digit Congressional district code, for example VA-001. Hover over this field for additional instructions.**

Use the Next Site button to expand the form to add additional Project/Performance Site Locations.

**7. DISCLOSURE OF LOBBYING ACTIVITIES (SF-LLL)**

If applicable, complete SF- LLL. Applicability: If any funds other than Federal appropriated funds have been paid or will be paid to any person for influencing or attempting to influence an officer or employee of any agency, a Member of Congress, an officer or employee of Congress, or an employee of a Member of Congress in connection with the grant/cooperative agreement, you must complete and submit Standard Form - LLL, "Disclosure Form to Report Lobbying."

**8. SUMMARY OF REQUIRED FORMS AND FILES**

Your application must include the following documents:

**Summary of Required Forms/Files**

| <b>Name of Document</b>                               | <b>Format</b> | <b>Attach to</b> |
|---|---------------|------------------|
| <b>SF 424 (R&amp;R)</b>                               | Form          | N/A              |
| <b>RESEARCH AND RELATED Other Project Information</b> | Form          | N/A              |
| Project Summary/Abstract                              | PDF           | Field 7          |
| Project Narrative, including required appendices      | PDF           | Field 8          |
| Project Management Plan                               | PDF           | Field 12         |
| Commitment Letters from Third Parties                 | PDF           | Field 12         |

|   |      |                             |
|---|------|-----------------------------|
| Teaching Professor/Student Employment Certification                                     | PDF  | Field 12                    |
| Budget for DOE FFRDC, if applicable   | PDF  | Field 12                    |
| <b>RESEARCH &amp; RELATED SENIOR/KEY PERSON</b>   | Form | N/A                         |
| Biographical Sketch   | PDF  | Attach to appropriate block |
| <b>RESEARCH AND RELATED BUDGET (Total Fed + Non-Fed)</b>                                | Form | N/A                         |
| Budget Justification  | PDF  | Field K                     |
| <b>R&amp;R SUBAWARD BUDGET (Total Fed + Non-Fed) ATTACHMENT(S) FORM</b> , if applicable | Form | N/A                         |
| <b>Project/Performance Site Location(s)</b>   | Form | N/A                         |
| <b>SF-LLL Disclosure of Lobbying Activities</b> , if applicable                         | Form | N/A                         |

#### D. SUBMISSIONS FROM SUCCESSFUL APPLICANTS

If selected for award, DOE reserves the right to request additional or clarifying information for any reason deemed necessary, including, but not limited to:

- Indirect cost information
- Other budget information
- Name and phone number of the Designated Responsible Employee for complying with national policies prohibiting discrimination (See 10 CFR 1040.5)
- Representation of Limited Rights Data and Restricted Software, if applicable
- Information on potential environmental impacts(See [http://www.netl.doe.gov/business/forms.html#POST\\_SEL\\_AP](http://www.netl.doe.gov/business/forms.html#POST_SEL_AP))

#### E. SUBMISSION DATES AND TIMES

##### 1. Pre-application Due Date

Pre-applications are not required.

##### 2. Application Due Date

Applications should be received by August 11, 2009 not later than 8:00:00 PM Eastern Time. You are encouraged to transmit your application well before the deadline. **APPLICATIONS RECEIVED AFTER THE DEADLINE WILL NOT BE REVIEWED OR CONSIDERED FOR AWARD.**

## F. INTERGOVERNMENTAL REVIEW

This program is not subject to Executive Order 12372 – Intergovernmental Review of Federal Programs.

## G. FUNDING RESTRICTIONS

Cost Principles: Costs must be allowable in accordance with the applicable Federal cost principles referenced in 10 CFR Part 600. The cost principles for commercial organizations are in FAR Part 31. The cost principles applicable to educational institutions are included under OMB Circular A-21.

Pre-award Costs: Recipients may charge to an award resulting from this announcement pre-award costs that were incurred within the ninety (90) calendar day period immediately preceding the effective date of the award, if the costs are allowable in accordance with the applicable Federal cost principles referenced in 10 CFR Part 600. Recipients must obtain the prior approval of the contracting officer for any pre-award costs that are for periods greater than this 90 day calendar period.

Pre-award costs are incurred at the applicant's risk. DOE is under no obligation to reimburse such costs if for any reason the applicant does not receive an award or if the award is made for a lesser amount than the applicant expected.

Other – Foreign Travel: Cost of foreign travel is not allowable under an award made as a result of this announcement.

## H. OTHER SUBMISSION AND REGISTRATION REQUIREMENTS

### 1. Where to Submit

**APPLICATIONS MUST BE SUBMITTED THROUGH FEDCONNECT TO BE CONSIDERED FOR AWARD.** Submit electronic applications through the FedConnect portal at [www.fedconnect.net](http://www.fedconnect.net). Information regarding how to submit applications via FedConnect can be found at [https://www.fedconnect.net/FedConnect/PublicPages/FedConnect\\_Ready\\_Set\\_Go.pdf](https://www.fedconnect.net/FedConnect/PublicPages/FedConnect_Ready_Set_Go.pdf).

Further, it is the responsibility of the applicant, prior to the offer due date and time, to verify successful transmission.

### 2. Registration Process

There are several one-time actions you must complete to submit an application in response to this Announcement (e.g., obtain a DUNS number, register with the CCR, and register with FedConnect). Applicants, who are not registered with CCR and FedConnect, should allow at least 10 days to complete these requirements. It is suggested that the process be started as soon as possible.

## **SECTION V - APPLICATION REVIEW INFORMATION**

### **A. CRITERIA**

#### **1. Initial Review Criteria**

Prior to a comprehensive merit evaluation, DOE will perform an initial review to determine that (1) the applicant is eligible for an award; (2) the information required by the announcement has been submitted; (3) all mandatory requirements are satisfied; and (4) the proposed project is responsive to the objectives of the funding opportunity announcement.

#### **2. Merit Review Criteria**

##### **Criterion 1. Scientific and Technical Merit (50%)**

- Degree to which the proposed technology or methodology represents an important advancement toward achieving the overall Program Objectives as well as the specific Research Objectives of the targeted Area of Interest.
- The degree to which the proposed work identifies and/or makes progress on new concepts, thereby increasing the likelihood of a new successful technology or methodology.
- Feasibility of the proposed concept; the degree to which the proposed work is based on sound scientific and engineering principles.
- Adequacy of the discussion of current level of development of analogous technologies or methodologies, including the discussion of competing commercial and emerging technologies, identification of the end users of the proposed technology or methodology, and discussion of how the proposed technology or methodology would benefit these end-users.
- Degree to which the applicant has considered all aspects required to incorporate their technology or methodology into an existing or future CCS effort.
- Adequacy of the discussion of the risks associated with the proposed technology.

##### **Criterion 2. Technical Approach and Understanding (25%)**

- Adequacy and feasibility of the applicant's technical approach, work plan, and risk assessment and management plan.
- Degree to which the applicant has discussed how the research conducted will help to train the students performing the effort.
- Appropriateness, rationale, and completeness of the proposed SOPO.
- Reasonableness of the proposed project schedule, staffing plan and planned travel.

##### **Criterion 3. Applicant/Team Capabilities, Organization and Facilities (15%)**

- Appropriateness and extent of key personnel credentials, capabilities, and experience.
- Demonstrated experience of the applicant and participating organizations in the technology areas addressed in the application and in managing similar projects.
- Clarity, logic and likely effectiveness of the project organization, including subcontractors; the roles and responsibilities of each partner for each task and the availability of key personnel to complete the proposed project.
- The adequacy (quality, availability, and appropriateness) of the facilities and equipment to perform project tasks.



#### **Criterion 4. Project Management Plan (10%)**

This criterion relates entirely to the stand-alone Project Management Plan described in this Funding Opportunity Announcement under Section IV. C. 3, Other Attachments. If the Application does not include this stand-alone Project Management Plan, reviewers will be instructed to assign a score of zero to this criterion. In general, this criterion evaluates the completeness, clarity and effectiveness of the Project Management Plan in establishing a credible project base and in delineating how the SOPO will be successfully executed. Items to be assessed include effectiveness of risk management methodologies and procedures, resource loaded schedule including sequencing of project activities, such as milestones and decision points, success criteria, and organizational structure and management.

The following specific aspects of the Project Management Plan shall be evaluated.

- Adequacy and completeness of the discussion of how the specific tasks to be performed under the SOPO are designed and integrated to achieve the project objectives, including the scheduling and sequencing of all tasks and the identification of key relationships between task activities and important milestones and decision points.
- Adequacy of the plan for establishing the baseline cost for the project and for assigning costs to specific tasks identified in the SOPO.
- Adequacy of the project management system to monitor and control project scope, cost, and schedule.
- Adequacy of the plan for ensuring effective coordination and communication between: (1) all project team members and other project participants, including technical, business, financial, permitting and other appropriate entities; (2) the project performers and DOE; and (3) the project performers and external stakeholders.
- Adequacy of the plan for assessing, identifying, tracking, and managing project risk
- Adequacy of the plan for assessing, monitoring, and reporting the potential environmental impacts to air, land and water resources, and potential impacts of waste production.

#### **3. Other Selection Factors**

The selection official will consider the following program policy factors in the selection process:

- It may be desirable to select for award a group of projects which represents a diversity of technical approaches and methods.
- It may be desirable to support complementary and/or duplicative efforts or projects, which, when taken together, will best achieve the research goals and objectives.
- It may be desirable that different kinds and sizes of organizations be selected for award to provide a balanced programmatic effort and a variety of different technical perspectives.
- It may be desirable, because of the type of projects envisioned, or limitations of past efforts, to select for award a group of projects with a broad or specific geographic distribution.
- It may be desirable to select projects that have more than the minimum of two students supported by the grant to so to maximize the training conducted.
- The amount of cost share offered by applicants will be a consideration when making selections.

#### **ARRA 2009 Application Review Information Criteria**

- It is desirable to select those projects that have the greatest likelihood of creating or preserving jobs in support of the Recovery Act.

### **B. REVIEW AND SELECTION PROCESS**

#### **1. Merit Review**

## **Applications Subject to Merit Review**

Applications that pass the initial review will be subjected to a merit review in accordance with the guidance provided in the "Department of Energy Merit Review Guide for Financial Assistance." This guide is available under Financial Assistance, Regulations and Guidance at <http://www.management.energy.gov/documents/meritrev.pdf>.

## **2. Selection**

### **Selection Official Consideration**

The Selection Official will consider the merit review recommendation, program policy factors, and the amount of funds available.

## **3. Discussions and Award**

### **Government Discussions with Applicant**

The Government may enter into discussions with a selected applicant for any reason deemed necessary, including but not limited to: (1) the budget is not appropriate or reasonable for the requirement; (2) only a portion of the application is selected for award; (3) the Government needs additional information to determine that the recipient is capable of complying with the requirements in 10 CFR Part 600; and/or (4) special terms and conditions are required. Failure to resolve satisfactorily the issues identified by the Government will preclude award to the applicant.

## **C. ANTICIPATED NOTICE OF SELECTION AND AWARD DATES**

DOE anticipates making awards no later than December 23, 2009.

## **SECTION VI - AWARD ADMINISTRATION INFORMATION**

### **A. AWARD NOTICES**

#### **1. Notice of Selection**

##### **Selected Applicants Notification**

DOE will notify applicants selected for award. This notice of selection is not an authorization to begin performance. (See Part IV.G with respect to the allowability of pre-award costs.)

##### **Non-selected Notification**

Organizations whose applications have not been selected will be advised as promptly as possible.

#### **2. Notice of Award**

A Notice of Financial Assistance Award issued by the contracting officer is the authorizing award document. It normally includes either as an attachment or by reference: (1). Special Terms and Conditions; (2). Applicable program regulations, if any; (3). Application as approved by DOE; (4). DOE assistance regulations at 10 CFR part 600; (5). National Policy Assurances To Be Incorporated As Award Terms; (6). Budget Summary; and (7). Federal Assistance Reporting Checklist, which identifies the reporting requirements.

### **B. ADMINISTRATIVE AND NATIONAL POLICY REQUIREMENTS**

#### **1. Administrative Requirements**

The administrative requirements for DOE grants and cooperative agreements are contained in 10 CFR Part 600 (See: <http://ecfr.gpoaccess.gov>). Grants and cooperative agreements made to universities, non-profits and other entities subject to OMB Circular A-110 are subject to the Research Terms and Conditions located on the National Science Foundation web site at <http://www.nsf.gov/bfa/dias/policy/rtrc/index.jsp>.

##### **ARRA 2009 Award Administration Information**

Special Provisions relating to work funded under American Recovery and Reinvestment Act of 2009, Pub. L. 111-5 shall apply. These provisions can be found at [http://management.energy.gov/policy\\_guidance/1672.htm](http://management.energy.gov/policy_guidance/1672.htm).

#### **2. Special Terms and Conditions and National Policy Requirements**

The DOE Special Terms and Conditions for Use in Most Grants and Cooperative Agreements are located at [http://management.energy.gov/business\\_doe/business\\_forms.htm](http://management.energy.gov/business_doe/business_forms.htm). The National Policy Assurances To Be Incorporated As Award Terms are located at DOE [http://management.energy.gov/business\\_doe/business\\_forms.htm](http://management.energy.gov/business_doe/business_forms.htm).

##### **Intellectual Property Provisions**

The standard DOE financial assistance intellectual property provisions applicable to the various types of recipients are located at [http://www.gc.doe.gov/financial\\_assistance\\_awards.htm](http://www.gc.doe.gov/financial_assistance_awards.htm).

### **C. REPORTING**

Reporting requirements are identified on the Federal Assistance Reporting Checklist, DOE F 4600.2, attached to the award agreement. See the NETL Business Page at <http://www.netl.doe.gov/business/forms/FederalAssistanceReportingChecklistExample> for the proposed Checklist for this program. Also see [http://management.energy.gov/policy\\_guidance/1672.htm](http://management.energy.gov/policy_guidance/1672.htm) for Recovery Act terms, conditions, and reporting requirements.

In addition, the Recipient will be required to submit a quarterly signed form that certifies the number of hours of training that each student received and/or hours of research conducted as pertaining to this grant.

## **SECTION VII - QUESTIONS/AGENCY CONTACTS**

### **A. QUESTIONS**

Questions regarding the **content** of the announcement must be submitted through the FedConnect portal. You must register with FedConnect to respond as an interested party to submit questions, and to view responses to questions. It is recommended that you register as soon after release of the FOA as possible to have the benefit of all responses. More information is available at <http://www.compusearch.com/products/fedconnect/fedconnect.asp>. DOE will try to respond to a question within 3 business days, unless a similar question and answer have already been posted on the website.

Questions pertaining to the **submission** of applications through FedConnect should be directed by e-mail to [support@FedConnect.net](mailto:support@FedConnect.net) or by phone to FedConnect Support at 800-899-6665.

### **B. AGENCY CONTACT**

Questions regarding FOA and program requirements must be directed to:

Contact Name:

Ashley E. Scekeres

E-mail Address:

[Ashley.Scekeres@netl.doe.gov](mailto:Ashley.Scekeres@netl.doe.gov)

## **SECTION VIII - OTHER INFORMATION**

### **A. MODIFICATIONS**

Notices of any modifications to this announcement will be posted on Grants.gov and the FedConnect portal. You can receive an email when a modification or an announcement message is posted by registering with FedConnect as an interested party for this FOA. It is recommended that you register as soon after release of the FOA as possible to ensure you receive timely notice of any modifications or other announcements. More information is available at <http://www.fedconnect.net> and <http://www.compusearch.com/products/fedconnect/fedconnect.asp>.

### **B. GOVERNMENT RIGHT TO REJECT OR NEGOTIATE**

DOE reserves the right, without qualification, to reject any or all applications received in response to this announcement and to select any application, in whole or in part, as a basis for negotiation and/or award.

### **C. COMMITMENT OF PUBLIC FUNDS**

The Contracting Officer is the only individual who can make awards or commit the Government to the expenditure of public funds. A commitment by other than the Contracting Officer, either explicit or implied, is invalid.

### **D. PROPRIETARY APPLICATION INFORMATION**

Patentable ideas, trade secrets, proprietary or confidential commercial or financial information, disclosure of which may harm the applicant, should be included in an application only when such information is necessary to convey an understanding of the proposed project. The use and disclosure of such data may be restricted, provided the applicant includes the following legend on the first page of the project narrative and specifies the pages of the application which are to be restricted:

“The data contained in pages *[Insert pages]* of this application have been submitted in confidence and contain trade secrets or proprietary information, and such data shall be used or disclosed only for evaluation purposes, provided that if this applicant receives an award as a result of or in connection with the submission of this application, DOE shall have the right to use or disclose the data herein to the extent provided in the award. This restriction does not limit the government’s right to use or disclose data obtained without restriction from any source, including the applicant.”

To protect such data, each line or paragraph on the pages containing such data must be specifically identified and marked with a legend similar to the following:

“The following contains proprietary information that (name of applicant) requests not be released to persons outside the Government, except for purposes of review and evaluation.”

### **E. EVALUATION AND ADMINISTRATION BY NON-FEDERAL PERSONNEL**

In conducting the merit review evaluation, the Government may seek the advice of qualified non-Federal personnel as reviewers. The Government may also use non-Federal personnel to conduct routine, nondiscretionary administrative activities. The applicant, by submitting its application, consents to the use of non-Federal reviewers/administrators. Non-Federal reviewers

must sign conflict of interest and non-disclosure agreements prior to reviewing an application. Non-Federal personnel conducting administrative activities must sign a non-disclosure agreement.

#### **F. INTELLECTUAL PROPERTY DEVELOPED UNDER THIS PROGRAM**

Rights in Technical Data. Normally, the government has unlimited rights in technical data created under a DOE agreement. Delivery or third party licensing of proprietary software or data developed solely at private expense will not normally be required except as specifically negotiated in a particular agreement to satisfy DOE's own needs or to insure the commercialization of technology developed under a DOE agreement.

#### **G. NOTICE REGARDING ELIGIBLE/INELIGIBLE ACTIVITIES**

Eligible activities under this program include those which describe and promote the understanding of scientific and technical aspects of specific energy technologies, but not those which encourage or support political activities such as the collection and dissemination of information related to potential, planned or pending legislation.